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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/879,831	06/13/2001	Ari Hottinen	P 280346 T298101US/PYK/kp	3478

909 7590 07/12/2006

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EXAMINER	
ZHENG, EVA Y	
ART UNIT	**PAPER NUMBER**
2611	

DATE MAILED: 07/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/879,831	HOTTINEN ET AL.	
	Examiner	Art Unit	
	Eva Yi Zheng	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 April 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-15,26-32,35-39,41-45,53-56 and 103-112* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-15,26-32,35-39,41-45,53-56 and 103-112* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 3-8, 9-15, 26-32, 35-39, 41-45, 53-56, and 103-112 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

2. Claims 103, 105, 107, 108-112 objected to because of the following informalities: recitation: "the transmit power" should be changed to – transmit power --, in order to avoid lack of antecedent.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. Claims 110 and 112 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 110 and 112 are apparatus claims regarding to a transmitter from the preamble, however, the transmitter comprising a plurality of transceivers is unclear and confusing.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

5. Claims 9, 103 and 109 are rejected under 35 U.S.C. 102(a) as being anticipated by Applicant Admitted Prior Art (AAPA).

a) Regarding to claim 103, AAPA disclose a method of transmitting a digital signal from a transmitter of a base station to a receiver in a radio system, the method comprising:

the transmitter coding the signal with a space-time block code (background of the invention [0008]);

the transmitter transmitting the signal via at least two different transmit antenna paths so that a part of the space-time block coded signal is transmitted through each transmit antenna path, the transmit antenna paths being connected to one base station (background of the invention [0008]);

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter using changeable weighting coefficients determined for each transmit antenna path (background of the invention [0009]).

b) Regarding to claim 109, AAPA disclose A transmitter of a base station, the transmitter being configured to transmit a digital signal to a receiver in a radio system, the transmitter comprising:

means for coding the signal with a space-time block code (background of the invention [0008]); and

means for transmitting the signal via at least two different transmit antenna paths so that a part of the space-time block coded signal is transmitted through each transmit antenna path, the transmit antenna paths being connected to one base station (background of the invention [0008]);

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another using changeable weighting coefficients determined for each transmit antenna path (background of the invention [0009]).

c) Regarding to claim 9, AAPA disclose wherein the weighting coefficients used in the transmission are signaled to the receiver (background of the invention [0008-0009]).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 3-7, 10-15, 26-31, and 104 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (AAPA) in view of Harrison (US 6,154,485).

a) Regarding to claim 104, AAPA disclose all the subject matters above except for the specific teaching of the method.

However, Harrison, in the same field of endeavor, disclose wherein the receiver receives the signal (Harrison 120 in Fig. 1);

the receiver performs measurements on the received signals that were transmitted via the different transmit antenna paths (Harrison 149 in Fig. 1);

the receiver signals to the transmitter the weighting coefficient data formed on the basis of the measurements (Harrison 86 and 88 in Fig. 1); and

the transmitter forms weighting coefficients using the weighting coefficient data signaling (Harrison 90 and 92 in Fig. 1).

Therefore, it is obvious to one of ordinary skill in art to combine the teaching of space-time block code by AAPA with the orthogonal transmit diversity system of Harrison. By doing so, improve multi-path fading, reduce cost, and improve antenna diversity systems.

b) Regarding claim 26, AAPA disclose all the subject matters above except for the specific teaching of the method.

However, Harrison, in the same field of endeavor, disclose a user equipment of the radio system determines the weighting coefficients (90 and 92 in Fig. 1) used by the network part of the radio system in transmitting to the user equipment in question.

Therefore, it is obvious to one of ordinary skill in art to combine the teaching of space-time block code by AAPA with the orthogonal transmit diversity system of

Harrison. By doing so, improve multi-path fading, reduce cost, and improve antenna diversity systems.

c) Regarding claim 27, AAPA disclose all the subject matters above except for the specific teaching of the method.

However, Harrison, in the same field of endeavor, disclose the network part of the radio system determines itself the weighting coefficients it uses in transmission (Fig. 1).

Therefore, it is obvious to one of ordinary skill in art to combine the teaching of space-time block code by AAPA with the orthogonal transmit diversity system of Harrison. By doing so, improve multi-path fading, reduce cost, and improve antenna diversity systems.

d) Regarding claim 29, AAPA disclose all the subject matters above except for the specific teaching of the method.

However, Harrison, in the same field of endeavor, disclose a transmit antenna path is implemented by means of an antenna structure that provides phasing (as shown in Fig.1).

Therefore, it is obvious to one of ordinary skill in art to combine the teaching of space-time block code by AAPA with the orthogonal transmit diversity system of Harrison. By doing so, improve multi-path fading, reduce cost, and improve antenna diversity systems.

e) Regarding to claim 3, Harrison disclose wherein the transmitter forms a quality value for the weighting coefficient data signaling it has received, (Col 4, L27-37); and

the transmitter forms weighting coefficients by means of the quality value of the weighting coefficient data signaling and the signaling itself (as shown in Fig.1; Col 4, L27-37).

f) Regarding to claim 4, Harrison disclose the values of the weighting coefficients are predetermined, and the predetermined values of the weighting coefficients are divided into different groups, each of which has a particular weighting coefficient for each transmit antenna path, the weighting coefficient data signaling comprising information about which group of weighting coefficients the receiver wants to be used the weighting coefficient data signaling controlling the change from one group of weighting coefficients to another group of weighting coefficients (Col 5, L31-45; also see US pat. No.:6,067,324).

g) Regarding to claim 5, Harrison discloses the weighting coefficient data comprises information about the transmit antenna path via which the signal with the best quality value was transmitted (Col 3, L59-Col 4, L23).

h) Regarding claim 6, Harrison discloses the weighting coefficient data comprises differential information indicating how the ratios of the weighting coefficients for the transmit antenna paths are changed differentially (Col 5, L31-45; also see US pat. No.:6,067,324).

i) Regarding claim 7, Harrison discloses the weighting coefficient data comprises at least one channel parameter measured by the receiver (149 in Fig.1; Col 4, L27-37).

j) Regarding claim 10, AAPA disclose all the subject matters above except for the specific teaching of the method.

However, Harrison, in the same field of endeavor, discloses the weighting coefficients are signaled to the receiver by means of an identification sequence which is inserted in the transmitted signal and which varies depending on the weighting of the signal (90 and 92 in Fig.1).

Therefore, it is obvious to one of ordinary skill in art to combine the teaching of space-time block code by AAPA with the orthogonal transmit diversity system of Harrison. By doing so, improve multi-path fading, reduce cost, and improve antenna diversity systems.

k) Regarding claim 11, AAPA disclose all the subject matters above except for the specific teaching of the method.

However, Harrison, in the same field of endeavor, discloses the weighting coefficients are signaled to the receiver using modulation, spreading or coding of the signal specifically for each transmit antenna path (76 and 98 in Fig.1).

Therefore, it is obvious to one of ordinary skill in art to combine the teaching of space-time block code by AAPA with the orthogonal transmit diversity system of Harrison. By doing so, improve multi-path fading, reduce cost, and improve antenna diversity systems.

l) Regarding claim 28, Harrison disclose the network part of the radio system takes into account the loading of each power amplifier over the transmit antenna path when it makes the decision (Col 1, L27-32).

m) Regarding claim 30, Harrison disclose the phasing is determined by means of channel parameters signaled by the receiver (124,126,128, 130, 148 in Fig.1).

n) Regarding claim 31, Harrison disclose wherein the phasing of transmission is determined by means of signals that have arrived at the same antenna elements (Fig. 1).

o) Regarding claim12, Harrison discloses the identification data for the group of weighting coefficients used in the transmission is signaled to the receiver using identification bits inserted in the transmitted signal (104 and 106 in Fig.1).

p) Regarding to claims 13-15, Harrision disclose wherein, when the quality value for signaling falls below a predetermined threshold value, the weighting coefficients are not changed. (Harrision implicitly discloses that the channel measurement and feedback processor controls the filter coefficient in any appropriate formats (Col 4, L24-37). Therefore, the coefficients by Harrison are set in any way, which including changing, unchanging, or equal to some threshold, that would be appropriate for the communication system).

8. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (AAPA) in view of Harrison (US 6,154,485), further in view of Greenstin et al. (6,131,016).

a) Regarding to claim 32, AAPA and Harrision disclose all the subject matters above except for the specific teaching of the method.

However, Greenstin et al., in the same field of endeavor, diclose wherein transmissions are sent from at least one antenna element with at least two different phases or antenna beams, such that signals to be transmitted with different phases

have different pilot sequences, identification sequences, structures or different coding (Fig. 1).

Therefore, it is obvious to one of ordinary skill in art to combine the teaching of space-time block code by AAPA with the communication system of Greenstin et al. By doing so, improve multi-path fading, reduce cost, and improve antenna diversity systems.

9. Claims 41, 53-56, 42-45, 105, and 106 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harrison (US 6,154,485) in view of Calderbank et al. (US 6,889,355).

a) Regarding to claim 105, Harrison disclose radio system for transmitting a digital signal, comprising:

a transmitter of a base station for transmitting a signal (50 in Fig. 1);

at least two transmit antenna paths that can be connected to the transmitter (116 and 118 in Fig. 1);

a receiver for receiving the signal (56 in Fig. 1);

wherein the transmitter comprises

changing means for changing the weighting coefficients determined for each transmit antenna path with respect to one another (149 in Fig. 1), and

weighting means for weighting the transmit power of the signals to be transmitted via different transmit antenna paths using weighting coefficients that can be changed with respect to one another (90 and 92 in Fig. 1; Col 3, L27-31).

Harrison disclose all the subject matters above except for the specific teaching of coding the signal with a space-time block code. However, Calderbank et al., in the same field of endeavor, disclose that an antenna diversity transmitting system can be improved by splitting the information signal into two paths with two antennas, where the second path has a delay element (Col 2, L10-21; Fig. 1B). Therefore, it is obvious to one of ordinary skill in art to combine the teaching of delay in transmitter path of Calderbank et al. in the orthogonal transmit diversity system of Harrison. By doing so, improve multi-path fading, reduce cost, and improve antenna diversity systems.

b) Regarding to 106, Harrison disclose wherein:

the receiver comprises means for performing measurements on the received signals that were transmitted via the different transmit antenna paths, and means for signaling to the transmitter the weighting coefficient data formed on the basis of the measurements (149 in Fig. 1; Col 4, L27-38);

the transmitter comprises means for receiving the weighting coefficient data signaling, and the changing means form weighting coefficients using the weighting coefficient data signaling (86 and 88 in Fig.1; Col 3, L27-31).

c) Regarding claim 53, Harrison disclose a user equipment of the radio system determines the weighting coefficients (90 and 92 in Fig. 1) used by the network part of the radio system in transmitting to the user equipment in question.

d) Regarding claim 54, Harrison disclose the network part of the radio system determines itself the weighting coefficients it uses in transmission (Fig. 1).

e) Regarding claim 56, Harrison disclose a transmit antenna path is implemented by means of an antenna structure that provides phasing (as shown in Fig.1).

f) Regarding claim 41, Harrison disclose the transmitter comprises means for signaling the weighting coefficients used in the transmission to the receiver using pilot bits inserted in the transmitted signal (as shown in Fig.1).

g) Regarding claim 55, Harrison disclose the network part of the radio system takes into account the loading of each power amplifier over the transmit antenna path when it makes the decision (Col 1, L27-32).

h) Regarding to claim 35, Harrison disclose wherein the transmitter comprises means for forming a quality value for the weighting coefficient data signaling it has received (Col 4, L27-37); and the changing means form weighting coefficients using the quality value of the weighting coefficient data signaling and the signaling itself (as shown in Fig.1; Col 4, L27-37).

i) Regarding claim 36, Harrison discloses the values of the weighting coefficients are predetermined, and the predetermined values of the weighting coefficients are divided into different groups, each of which has a particular weighting coefficient for each transmit antenna path, the weighting coefficient data signaling comprising information about which group of weighting coefficients the receiver wants to be used, the weighting coefficient data signaling controlling the change from one group of weighting coefficients to another group of weighting coefficients (Col 5, L31-45; also see US pat. No.:6,067,324).

j) Regarding claim 37, Harrison discloses the weighting coefficient data comprises information about the transmit antenna path via which the signal with the best quality value was transmitted (Col 3, L59-Col 4, L23).

k) Regarding claim 38, Harrison discloses the weighting coefficient data comprises differential information indicating how the ratios of the weighting coefficients for the transmit antenna paths are changed differentially (Col 5, L31-45; also see US pat. No.:6,067,324).

l) Regarding claim 39, Harrison discloses the weighting coefficient data comprises at least one channel parameter measured by the receiver (149 in Fig.1; Col 4, L27-37).

m) Regarding claim 42, Harrison discloses the identification data for the group of weighting coefficients used in the transmission is signaled to the receiver using identification bits inserted in the transmitted signal (104 and 106 in Fig.1).

p) Regarding to claims 43-45, Harrision disclose wherein, when the quality value for signaling falls below a predetermined threshold value, the weighting coefficients are not changed. (Harrision implicitly discloses that the channel measurement and feedback processor controls the filter coefficient in any appropriate formats (Col 4, L24-37). Therefore, the coefficients by Harrison are set in any way, which including changing, unchanging, or equal to some threshold, that would be appropriate for the communication system).

10. Claim 110 is rejected under 35 U.S.C. 102(a) as being anticipated by Applicant Admitted Prior Art (AAPA) in view of Schneider (US 5,781,541).

a) Regarding to claim 110, AAPA disclose a transmitter of a base station, the transmitter being configured to transmit a digital signal to a radio system, the transmitter comprising:

the channel coder configured to code the signal with a space-time block code (background of the invention [0008]);

the transmitter transmitting the signal via at least two different transmit antenna paths so that a part of the space-time block coded signal is transmitted through each transmit antenna path, the transmit antenna paths being connected to one base station (background of the invention [0008]);

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter using changeable weighting coefficients determined for each transmit antenna path (background of the invention [0009]).

AAPA disclose all the subject matters above except for the specific teaching of a plurality of transceivers to transmit signals. However, Schneider, in the same field of endeavor disclose a plurality of transceivers with delay path (as shown in Fig. 3). This is well known knowledge in the CDMA communication system. Therefore, it is obvious to one of ordinary skill in art to implement the transmitter system as taught by AAPA in the plurality transceivers of Schneider. By doing so, improve multi-path fading, reduce cost, and improve antenna diversity systems.

Double Patenting

11. Claims 3-8, 9-15, 26-32, 35-39, 41-45, 53-56, and 103-112 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-28 of U.S. Patent No. 7,058,363. Although the conflicting claims are not identical, they are not patentably distinct from each other because the patent and the application are claiming common subject matter, as follows: a transmitter for transmitting signals with at least two transmit antenna paths; a receiver for receiving signals; weighting means for weighting signals to be transmitted via the different transmit antenna path by means of changeable weighting coefficients; means for coding the signal to be transmitter; changing means for changing weighting coefficients determined for each transmit antenna paths.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eva Y Zheng whose telephone number is 571-272-3049. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eva Yi Zheng
Examiner
Art Unit 2611

July 5, 2006

CHIEH M. FAN
SUPERVISORY PATENT EXAMINER